

38/3,K/11 (Item 11 from file: 350) Links  
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010135468      \*\*Image available\*\*

WPI Acc No: 1995-036719/199505

XRPX Acc No: N95-028884

**Method for allocating files in file system using  
disk arrays for storage - has mode selected with dirty  
block from list with write allocation of tree or buffers  
for reference for storage in raid array with determination of  
completion**

Patent Assignee: NETWORK APPLIANCE INC (NETW-N); HITZ D (HITZ-I); LAU J  
(LAUJ-I); MALCOLM M (MALC-I); RAKITZIS B (RAKI-I); NETWORK APPLIANCE CORP  
(NETW-N)

Inventor: HITZ D; LAU J; MALCOLM M; RAKITZIS B

Number of Countries: 020    Number of Patents: 012

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9429796	A1	19941222	WO 94US6322	A	19940602	199505	B
EP 701716	A1	19960320	EP 94919368	A	19940602	199616	
			WO 94US6322	A	19940602		
JP 8511369	W	19961126	WO 94US6322	A	19940602	199708	
			JP 95502001	A	19940602		
CA 2165911	A	19970622	CA 2165911	A	19951221	199743	N
US 6038570	A	20000314	US 9371640	A	19930603	200020	
			US 95464591	A	19950531		
US 6138126	A	20001024	US 95464591	A	19950531	200055	N
			US 99359168	A	19990721		
EP 1197836	A2	20020417	EP 94919368	A	19940602	200233	
			EP 2002858	A	19940602		
EP 701716	B1	20020814	EP 94919368	A	19940602	200255	
			WO 94US6322	A	19940602		
			EP 2002858	A	19940602		
DE 69431186	E	20020919	DE 94631186	A	19940602	200269	
			EP 94919368	A	19940602		
			WO 94US6322	A	19940602		
US 20040064474	A1	20040401	US 9371640	A	19930603	200425	
			US 95464591	A	19950531		
			US 99359168	A	19990721		
			US 2000624753	A	20000724		
			US 2003637803	A	20030808		
US 6751637	B1	20040615	US 95464591	A	19950531	200439	N
			US 99359168	A	19990721		
			US 2000624753	A	20000724		
CA 2165911	C	20050726	CA 2165911	A	19951221	200551	N

Priority Applications (No Type Date): US 9371640 A 19930603; CA 2165911 A  
19951221; US 95464591 A 19950531; US 99359168 A 19990721; US 2000624753 A  
20000724; US 2003637803 A 20030808

Patent Details:

Patent No    Kind    Lan    Pg    Main    IPC    Filing    Notes

WO 9429796 A1 E 66 G06F-012/02  
 Designated States (National): JP  
 Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LU MC NL  
 PT SE

EP 701716 A1 E 66 Based on patent WO 9429796  
 Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LI LU MC  
 NL PT SE

JP 8511369 W 68 G06F-012/00 Based on patent WO 9429796  
 CA 2165911 A G06F-017/30  
 US 6038570 A G06F-017/30 Cont of application US 9371640  
 US 6138126 A G06F-017/30 Cont of application US 95464591  
 EP 1197836 A2 E G06F-003/06 Div ex application EP 94919368  
 Div ex patent EP 701716  
 Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LI LU MC  
 NL PT SE

EP 701716 B1 E G06F-012/02 Related to application EP 2002858  
 Related to patent EP 1197836  
 Based on patent WO 9429796  
 Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LI LU MC  
 NL PT SE

DE 69431186 E G06F-012/02 Based on patent EP 701716  
 Based on patent WO 9429796  
 US 20040064474 A1 G06F-017/00 Cont of application US 9371640  
 Cont of application US 95464591  
 Cont of application US 99359168  
 Div ex application US 2000624753  
 Cont of patent US 6038570  
 Cont of patent US 6138126  
 US 6751637 B1 G06F-017/30 Cont of application US 95464591  
 Cont of application US 99359168  
 Cont of patent US 6038570  
 Cont of patent US 6138126  
 CA 2165911 C E G06F-017/30

Method for allocating files in file system using  
 disk arrays for storage - ...

...has mode selected with dirty block from list with write  
 allocation of tree or buffers for reference for storage in  
 raid array with determination of completion

...Abstract (Basic): least one dirty block from a list of nodes having  
 dirty blocks. The method then **write allocates** a tree  
 (330) of buffers referenced by the node to a **storage** arrangement  
 in a RAID array (1030). It is then determined if all nodes in a...

...All unwritten stripes are then **flushed** to the raid array (350).  
 The algorithm then terminates. When **files** are stored in  
**cache** and selected for **allocation**, directions are  
**allocated** first. Then files are **allocated** on a least  
 recently used basin...

...USE/ADVANTAGE - Multiple clients can **simultaneously** access different files stored on separate **disks** in the array. This reduces access time for retrieving or **storing** data...

...Title Terms: **ALLOCATE**;

35/3,K/6 (Item 6 from file: 350) Links

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015603745      \*\*Image available\*\*

WPI Acc No: 2003-665902/200363

XRPX Acc No: N03-531542

**A method of storing temporally consecutive values of  
at least one data item in a memory segment that can not be  
overwritten for small computing applications, uses sequential and  
bridging pointers**

Patent Assignee: SHARP KK (SHAF ); KAY A (KAYA-I); MILLER R (MILL-I)

Inventor: KAY A; MILLER R

Number of Countries: 103    Number of Patents: 006

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
GB 2386212	A	20030910	GB 20025573	A	20020309	200363    B
WO 200377133	A1	20030918	WO 2003JP2684	A	20030306	200371
AU 2003211775	A1	20030922	AU 2003211775	A	20030306	200431
US 20050119987	A1	20050602	WO 2003JP2684	A	20030306	200537
			US 2005506070	A	20050222	
JP 2003575281	X	20050707	JP 2003575281	A	20030306	200545
			WO 2003JP2684	A	20030306	
TW 200400432	A	20040101	TW 2003104924	A	20030307	200567

Priority Applications (No Type Date): GB 20025573 A 20020309

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
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GB 2386212	A		32	G06F-012/02	
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WO 200377133	A1	J		G06F-012/02	
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Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA  
CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN  
IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ  
OM PH PL PT RO RU SC SD SE SG SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN  
YU ZA ZM ZW

Designated States (Regional): AT BE BG CH CY CZ DE DK EA EE ES FI FR GB  
GH GM GR HU IE IT KE LS LU MC MW MZ NL OA PT RO SD SE SI SK SL SZ TR TZ  
UG ZM ZW

AU 2003211775	A1			G06F-012/02	Based on patent WO 200377133
US 20050119987	A1			G06F-007/00	
JP 2003575281	X	39		G06F-012/02	Based on patent WO 200377133
TW 200400432	A			G06F-012/00	

**A method of storing temporally consecutive values of  
at least one data item in a memory segment that can not be  
overwritten for small computing applications, uses sequential and  
bridging pointers**

Abstract (Basic):

...      A method of **storing** temporally consecutive values in a  
memory that can not be **overwritten** comprises **storing** data

as sets, each of which has two **pointers**, a local **pointer** and a far **pointer**, to enable chains to be established. The local, sequential, **pointer** is written to the data set immediately preceding the current set and the far, bridging, **pointer** to a data set earlier in the chain, both point to the current set.

... An INDEPENDENT CLAIM is included for an apparatus for **storing** temporally consecutively values of at least one data item...

...computing applications, such as embedded systems, including smart cards such as Java cards, digital active **storage** or security devices such as smart cards and smart **discs**, SIMS and USIMs for mobile telephones, data logging devices, small devices which record user preferences, store settings or log usage, computer systems in vehicles, set-top boxes and internet **routers**.

...The use of sequential and bridging **pointers** allows the chain to be shortened by jumping or bridging intermediate data sets facilitating the use of flash memory which has slow **erase** times and may rapidly wear out with repeated **erasure** required to the data in the same location each time it changes...

...The figure illustrates the initial part of a **Persistent** Data Item (PDI) structure after a large number of updates

...Title Terms: **STORAGE**;

International Patent Class (Main): **G06F-007/00**...

...**G06F-012/00**...

...**G06F-012/02**

Manual Codes (EPI/S-X): **T01-F05E**...

...**T01-H01C3**...

...**T01-H01D**

Set	Items	Description
S1	339800	S (MEMOR? OR INMEMORY? OR CACHE? OR BUFFER? OR INCACH? OR INBUFFER?) (5N) (DATA? OR RECORD? OR BLOCK? OR BYTE? OR BIT? ? OR PIECE?)
S2	168918	S (MEMOR? OR INMEMORY? OR CACHE? OR BUFFER? OR INCACH? OR INBUFFER?) (5N) (PACKET? OR CHUNK? OR FILE? OR CONTENT? OR INFORMATION?)
S3	25143	S (MEMOR? OR INMEMORY? OR CACHE? OR BUFFER? OR INCACH? OR INBUFFER?) (5N) (OBJECT? OR TRANSACTION? OR PORTION? OR PARCEL? OR SEGMENT?)
S4	686143	S DISK? OR DISC? ? OR DISKDRIV? OR DISCDRIV? OR HARDDISK? OR HDDISK? OR HDDISC?
S5	15	S HARDDISC? OR DATABASEDISK? OR DATABASEDISC? OR HARDDRIVEDISK? OR HARDDRIVEDISC?
S6	29954	S S1:S3 AND S4:S5
S7	9983	S TRANSFER? OR SEND? OR SHIP? OR DISPATCH? OR UPLOAD? OR DOWNLOAD? OR SENT? OR TRANSMI?
S8	18962	S FORWARD? OR POST??? OR COPY? OR WRITE? OR WRITING? OR STORING? OR STORAG? OR TRANSPORT?
S9	2481	S RELOCAT? OR MOVE? OR MOVING? OR MIGRAT? OR IMPORT? OR EXPORT? OR ROUTE? OR ROUTING?
S10	4502	S LAST OR PREVIOUS? OR BEFORE? OR FINAL? OR CONCLUD? OR END OR ENDED OR ENDING
S11	3176	S EARLY? OR EARLIER? OR PRIOR? OR PRELIMINAR? OR BEFOREHAND? OR PREDAT? OR PREDETERMIN?
S12	694	S CLOSING? OR LATEST? OR LATTER? OR TERMINAT? OR ULTIMAT? OR CONCLUS? OR REARMOST? OR REARWARD?
S13	1780	S BACK? OR CULMINAT?
S14	1379	S COMMIT? OR DEDICAT? OR RESERV? OR FINALIZ? OR FINALIS? OR SAVED OR SAVING OR PERMANEN? OR NONTEMPORAR?
S15	758	S ALLOCAT? OR CONSIGN? OR PERPETUAL? OR ENDUR? OR PERSISTEN? OR PERSISTING? OR NONTRANSIEN? OR "NOT" () (TEMPORAR? OR TRANSIEN?)
S16	1046	S POINTER? OR ARROW? OR INDICATOR? OR MARKER? OR LOCATOR? OR IDENTIFIER? OR LABEL?
S17	1319	S FLUSH? OR DELET? OR EXPUNG? OR RID OR RIDS OR RIDDING OR REMOV? OR EXCIS?
S18	2910	S ERAS? OR OVERWRIT? OR (TAKE? OR TAKING? OR TAKEN) () OUT OR ELIMINAT? OR UNINSTALL? OR DEINSTALL?
S19	2683	S SYNCHRON? OR CONCURR? OR COOCCUR? OR ISOCHRON? OR SIMULTAN?
S20	113	S CONTEMPORAN? OR SYNC???? OR IN() CONCERT? OR SYNCH???
S21	1297	S CONCURREN? OR COINCID? OR ( "SAME" OR IDENTIC? OR SIMILAR?) () TIME? ? OR SYNK??
S22	13838	S IC=G06F?
S23	8414	S MC=T01?
S24	7354	S S6 AND S1:S3(10N) S7:S9(10N) S4:S5
S25	551	S S6 AND S1:S3(10N) S19:S21(10N) S4:S5
S26	7354	S S24 OR (S24 AND S25)
S27	0	S S26 AND S16(7N) S14:S15 AND S16(7N) S17:S18
S28	4	S S26 AND S16 AND S14:S15 AND S17:S18
S29	3	S S26 AND S14:S15(10N) S17:S18(10N) S10:S13
S30	7	S S28:S29
S31	7	S S30 AND S22:S23
S32	20	S S6 AND S7:S9 AND S16 AND S14:S15 AND S17:S18
S33	18	S S32 AND S22:S23
S34	23	S S28:S33
S35	23	IDPAT (sorted in duplicate/non-duplicate order)
S36	25	S S6 AND S7:S9 AND S14:S15 AND S17:S18 AND S19:S21
S37	23	S S36 NOT S34
S38	23	IDPAT (sorted in duplicate/non-duplicate order)

; show files

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[File 350] **Derwent WPIX** 1963-2006/UD,UM &UP=200627

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*\*File 350: For more current information, include File 331 in your search. Enter **HELP NEWS 331** for details.*

35/3,K/11 (Item 11 from file: 350) Links  
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014249822      \*\*Image available\*\*  
WPI Acc No: 2002-070522/200210  
XRPX Acc No: N02-052248

**Disk storage device shifts data in defect  
sector to reserve sector without interrupting continuous data  
record operation with respect to disk**

Patent Assignee: MATSUSHITA DENKI SANGYO KK (MATU )

Number of Countries: 001    Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
JP 2001312376	A	20011109	JP 2000133094	A	20000502	200210 B

Priority Applications (No Type Date): JP 2000133094 A 20000502

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
JP 2001312376	A	6	G06F-003/06	

**Disk storage device shifts data in defect  
sector to reserve sector without interrupting continuous data  
record operation with respect to disk**

Abstract (Basic):

...      A **reserve** sector position management unit (2) manages the position of **reserve** sector on a rotation medium. An address **pointer** controller (7) controls defect and **reserve** sector address **pointer**, such that the data in defect sector are shifted to the **reserve** sector, without interrupting continuous data **write-in** operation to a rotation medium from a **data buffer**.

...      An INDEPENDENT CLAIM is also included for **disk** recording control method...

...**Disk storage device**...

...Time delay in head **transfer** operation and rotation, is **eliminated** as data in defect sector are shifted to a **reserve** sector during data recording, hence high speed **write-in** operation is achieved...

...The figure shows the component block diagram of **disk storage** device. (Drawing includes non-English language text...

...**Reserve** sector position management unit (2...

...Address **pointer** controller (7

Title Terms: **DISC**;



International Patent Class (Main): G06F-003/06

International Patent Class (Additional): G06F-012/16...

Manual Codes (EPI/S-X): T01-C01...

...T01-H01C4

Set	Items	Description
S1	76942	S (MEMOR? OR INMEMORY? OR CACHE? OR BUFFER? OR INCACH? OR INBUFFER?) (5N) (DATA? OR RECORD? OR BLOCK? OR BYTE? OR BIT? ? OR PIECE?)
S2	43472	S (MEMOR? OR INMEMORY? OR CACHE? OR BUFFER? OR INCACH? OR INBUFFER?) (5N) (PACKET? OR CHUNK? OR FILE? OR CONTENT? OR INFORMATION?)
S3	13768	S (MEMOR? OR INMEMORY? OR CACHE? OR BUFFER? OR INCACH? OR INBUFFER?) (5N) (OBJECT? OR TRANSACTION? OR PORTION? OR PARCEL? OR SEGMENT?)
S4	523176	S DISK? OR DISC? ? OR DISKDRIV? OR DISCDRIV? OR HARDDISK? OR HDDISK? OR HDDISC?
S5	15	S HARDDISK? OR DATABASEDISK? OR DATABASEDISC? OR HARDDRIVEDISK? OR HARDDRIVEDISC?
S6	7274	S S1:S3 AND S4:S5
S7	1403	S TRANSFER? OR SEND? OR SHIP? OR DISPATCH? OR UPLOAD? OR DOWNLOAD? OR SENT? OR TRANSMI?
S8	5048	S FORWARD? OR POST??? OR COPY? OR WRITE? OR WRITING? OR STORING? OR STORAG? OR TRANSPORT?
S9	952	S RELOCAT? OR MOVE? OR MOVING? OR MIGRAT? OR IMPORT? OR EXPORT? OR ROUTE? OR ROUTING?
S10	1258	S LAST OR PREVIOUS? OR BEFORE? OR FINAL? OR CONCLUD? OR END OR ENDED OR ENDING
S11	365	S EARLY? OR EARLIER? OR PRIOR? OR PRELIMINAR? OR BEFOREHAND? OR PREDAT? OR PREDETERMIN?
S12	275	S CLOSING? OR LATEST? OR LATTER? OR TERMINAT? OR ULTIMAT? OR CONCLUS? OR REARMOST? OR REARWARD?
S13	765	S BACK? OR CULMINAT? OR "NEAR" OR CLOSEST? OR PROXIMA?
S14	690	S COMMIT? OR DEDICAT? OR RESERV? OR FINALIZ? OR FINALIS? OR SAVED OR SAVING OR PERMANEN? OR NONTEMPORAR? OR FIXED
S15	742	S ALLOCAT? OR CONSIGN? OR PERPETUAL? OR ENDUR? OR PERSISTEN? OR PERSISTING? OR NONTRANSIEN? OR "NOT" () (TEMPORAR? OR TRANSIEN?)
S16	126	S POINTER? OR ARROW? OR INDICATOR? OR MARKER? OR LOCATOR? OR IDENTIFIER? OR LABEL?
S17	250	S FLUSH? OR DELET? OR EXPUNG? OR RID OR RIDS OR RIDDING OR REMOV? OR EXCIS?
S18	463	S ERAS? OR OVERWRIT? OR (TAKE? OR TAKING? OR TAKEN) () OUT OR ELIMINAT? OR UNINSTALL? OR DEINSTALL?
S19	719	S SYNCHRON? OR CONCURR? OR COOCCUR? OR ISOCHRON? OR SIMULTAN? OR RECONCIL?
S20	23	S CONTEMPORAN? OR SYNC???? OR IN()CONCERT? OR SYNCH??? OR CONTINUIT?
S21	441	S CONCURREN? OR COINCID? OR ( "SAME" OR IDENTIC? OR SIMILAR?) () TIME? ? OR SYNK??
S22	118	S S6 AND S1:S3 AND S4:S5 AND S7:S9 AND S14:S15 AND S17:S18
S23	59	S S22 AND (S10:S13 OR S19:S21)
S24	6	S S22 AND S16
S25	118	S S22:S24
S26	98	S S25 AND PY=1970:2003
S27	98	S S25 NOT PY=2004:2006
S28	98	S S26:S27
S29	71	RD (unique items)

; show files

[File 2] INSPEC 1898-2006/Apr W3

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[File 6] NTIS 1964-2006/Apr W2

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[File 8] Ei Compendex(R) 1970-2006/Apr W3

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[File 34] SciSearch(R) Cited Ref Sci 1990-2006/Apr W3

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[File 35] **Dissertation Abs Online** 1861-2006/Mar

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[File 56] **Computer and Information Systems Abstracts** 1966-2006/Apr

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[File 60] **ANTE: Abstracts in New Tech & Engineer** 1966-2006/Apr

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[File 65] **Inside Conferences** 1993-2006/Apr 26

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[File 94] **JICST-EPlus** 1985-2006/Jan W5

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[File 99] **Wilson Appl. Sci & Tech Abs** 1983-2006/Mar

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[File 111] **TGG Natl.Newspaper Index(SM)** 1979-2006/Apr 19

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[File 144] **Pascal** 1973-2006/Apr W1

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[File 239] **Mathsci** 1940-2006/Jun

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[File 256] **TecInfoSource** 82-2006/May

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29/3,K/5 (Item 5 from file: 2) Links

INSPEC

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07225485 INSPEC Abstract Number: C1999-05-6160-014

**Title:** Integrating reliable memory in databases

**Author** Wee Teck Ng; Chen, P.M.

**Author Affiliation:** Dept. of Electr. Eng. & Comput. Sci., Michigan Univ., Ann Arbor, MI, USA

**Conference Title:** Proceedings of the Twenty-Third International Conference on Very Large Databases p. 76-85

**Editor(s):** Jarke, M.; Carey, M.; Dittrich, K.R.; Lockovsky, F.; Loucopoulos, P.; Jeusfeld, M.A.

**Publisher:** Morgan Kaufmann Publishers, San Francisco, CA, USA

**Publication Date:** 1997 **Country of Publication:** USA xvi+599 pp..

**ISBN:** 1 55860 470 7 **Material Identity Number:** XX-1997-02713

**Conference Title:** Proceedings of VLDB 97: 23rd International Conference on Very Large Databases

**Conference Date:** 26-29 Aug. 1997 **Conference Location:** Athens, Greece

**Language:** English

**Subfile:** C

Copyright 1999, IEE

**Title:** Integrating reliable memory in databases

**Abstract:** ...it is possible to create an area of main memory that is as safe as disk from operating system crashes. This paper explores how to integrate the reliable memory provided by the Rio file cache into a database system. We propose three designs for integrating reliable memory into databases: non-persistent database buffer cache, persistent database buffer cache, and persistent database buffer cache with protection. Non-persistent buffer caches use an I/O interface to reliable memory and require the fewest modifications to existing databases. However, they waste memory capacity and bandwidth due to double buffering. Persistent buffer caches use a memory interface to reliable memory by mapping it into the database address space. This places reliable memory under complete database control and eliminates double buffering, but it may expose the buffer cache to database errors. Our third design reduces this exposure by write protecting the buffer pages. Extensive fault tests show that mapping reliable memory into the database address space does not significantly hurt reliability. This is because wild stores rarely touch dirty, committed pages written by previous transactions. As a result, we believe that databases should use a memory interface to reliable memory.

**Descriptors:** cache storage;

**Identifiers:** ...Rio file cache; ... ..database buffer cache; ... ..persistent database buffer cache; ... ..persistent database buffer cache with protection

1997

29/3,K/9 (Item 9 from file: 2) [Links](#)

Fulltext available through: [USPTO Full Text Retrieval Options](#)

INSPEC

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06429837 INSPEC Abstract Number: B9701-1265D-011, C9701-6120-007

**Title:** The Rio file cache: surviving operating system crashes

**Author** Chen, P.M.; Wee Teck Ng; Chandra, S.; Aycok, C.; Rajamani, G.; Lowell, D.

**Author Affiliation:** Dept. of Electr. Eng. & Comput. Sci., Michigan Univ., Ann Arbor, MI, USA

**Journal:** SIGPLAN Notices Conference Title: SIGPLAN Not. (USA) vol.31, no.9 p. 74-83

**Publisher:** ACM ,

**Publication Date:** Sept. 1996 **Country of Publication:** USA

**CODEN:** SINODQ **ISSN:** 0362-1340

**SICI:** 0362-1340(199609)31:9L:74:FCSO;1-L

**Material Identity Number:** S202-96009

**U.S. Copyright Clearance Center Code:** 0 89791 767 7/96/\$0010.\$3.50

**Conference Title:** 7th International Conference on Architectural Support for Programming Languages and Operating Systems

**Conference Sponsor:** ACM

**Conference Date:** 1-5 Oct. 1996 **Conference Location:** Cambridge, MA, USA

**Language:** English

**Subfile:** B C

Copyright 1996, IEE

**Title:** The Rio file cache: surviving operating system crashes

**Abstract:** One of the fundamental limits to high performance, high reliability file systems is memory's vulnerability to system crashes. Because memory is viewed as unsafe, systems periodically write data back to disk. The extra disk traffic lowers performance, and the delay period before data is safe lowers reliability. The goal of the Rio (RAM I/O) file cache is to make ordinary main memory safe for persistent storage by enabling memory to survive operating system crashes. Reliable memory enables a system to achieve the best of both worlds: reliability equivalent to a write through file cache, where every write is instantly safe, and performance equivalent to a pure write back cache, with no reliability induced writes to disk. To achieve reliability, we protect memory during a crash and restore it during a reboot... ..even without protection, warm reboot enables memory to achieve reliability close to that of a write through file system. Adding protection makes memory even safer than a write through file system while adding essentially no overhead. By eliminating reliability induced disk writes, Rio performs 4-22 times as fast as a write through file system, 2-14 times as fast as a standard Unix file system, and...

**Descriptors:** cache storage; ... ..random-access storage; ... ..storage management

**Identifiers:** Rio file cache; ... ..disk traffic... ..RAM I/O file cache; ... ..persistent storage; ... ..write through file cache; ... ..pure write back cache... ..write through file system... ..reliability induced disk writes

1996

29/3,K/11 (Item 11 from file: 2) Links

INSPEC

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05966804 INSPEC Abstract Number: C9507-6150J-014

**Title:** Opportunistic log: efficient installation reads in a reliable storage server

**Author** O'Toole, J.; Shriram, L.

**Author Affiliation:** Lab. for Comput. Sci., MIT, Cambridge, MA, USA

p. 39-48

**Publisher:** USENIX Assoc , Berkeley, CA, USA

**Publication Date:** 1994 **Country of Publication:** USA 280 pp.

**Conference Title:** Proceedings of 1st Symposium on Operation Systems Design and Implementation

**Conference Sponsor:** ACM; IEEE

**Conference Date:** 14-17 Nov. 1994 **Conference Location:** Monterey, CA, USA

**Language:** English

**Subfile:** C

Copyright 1995, IEE

**Title:** Opportunistic log: efficient installation reads in a reliable storage server

**Abstract:** In a distributed storage system, client caches managed on the basis of small granularity objects can provide better memory utilization than page-based caches. However, object servers, unlike page servers, must perform additional disk reads. These installation reads are required to install modified objects onto their corresponding disk pages. The opportunistic log is a new technique that significantly reduces the cost of installation reads. It defers the installation reads, removing them from the modification commit path, and manages a large pool of pending installation reads that can be scheduled efficiently... ..simulations, we show that the opportunistic log substantially enhances the I/O performance of reliable storage servers. An object server without the opportunistic log requires much better client caching to outperform... ..imply that efficient scheduling of installation reads can substantially improve the performance of large-scale storage systems and therefore introduces a new performance tradeoff between page-based and object-based architectures.

**Descriptors:** cache storage;

**Identifiers:** ...reliable storage server... ..distributed storage system... ..disk reads... ..disk pages...  
...modification commit path... ..large-scale storage systems

1994

29/3,K/35 (Item 6 from file: 8) [Links](#)

Ei Compendex(R)

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05005623 E.I. No: EIP98054178943

**Title: Disk cache design and performance as evaluated in large timesharing and database systems**

**Author:** Zivkov, Barbara Tockey; Smith, Alan Jay

**Corporate Source:** Univ of California, Berkeley, Berkeley, CA, USA

**Conference Title:** Proceedings of the 1997 23rd International Conference for the Resource Management & Performance Evaluation of Enterprise Computing Systems. Part 1 (of 2)

**Conference Location:** Orlando, FL, USA **Conference Date:** 19971207-19971212

**E.I. Conference No.:** 48275

**Source:** CMG Proceedings v 1 1997: CMG, Turnersville, NJ, USA. p 639-658

**Publication Year:** 1997

**CODEN:** CMPREY

**Language:** English

**Title:** Disk cache design and performance as evaluated in large timesharing and database systems

**Abstract:** We present trace-driven simulations of disk caches using traces from production timesharing and database systems. We compute miss and traffic ratios, run lengths, residency times, memory pollution, etc., with varying block size, prefetch and write algorithms. Prefetch produced limited decreases in miss ratio. Copy-back decreased disk writes. Periodic flushing of dirty blocks increased traffic slightly. Write-allocate had little effect. Large blocks weren't useful. Limiting cache occupancy by a single transaction had little effect. The study is unique in the variety and quality of the data...

**Descriptors:** \*Buffer storage; Database systems; Time sharing systems; Algorithms; Computational methods; Data processing; Computer simulation; Storage allocation (computer)

**Identifiers:** Trace driven simulations; Dirty blocks flushing

29/3,K/37 (Item 8 from file: 8) Links

Ei Compendex(R)

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04629421 E.I. No: EIP97023531879

**Title: Disk caching in large database and timeshared systems**

**Author:** Zivkov, Barbara Tockey; Smith, Alan Jay

**Corporate Source:** Univ of California, Berkeley, CA, USA

**Conference Title:** Proceedings of the 1997 5th International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems, MASCOTS'97

**Conference Location:** Haifa, Isr **Conference Date:** 19970112-19970115

**E.I. Conference No.:** 46048

**Source:** IEEE International Workshop on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems - Proceedings 1997. IEEE, Piscataway, NJ, USA, 97TB100096. p 184-195

**Publication Year:** 1997

**CODEN:** 85ORAG

**Language:** English

**Title:** Disk caching in large database and timeshared systems

**Abstract:** We present the results of a variety of trace-driven simulations of disk cache design using traces from a variety of mainframe timesharing and database systems in production... ..pollution and other statistics for a variety of designs, varying block size, prefetching algorithm and write algorithm. We find that for this workload, sequential prefetching produces a significant (about 20%) but still limited improvement in the miss ratio, even using a powerful technique for detecting sequentiality. Copyback writing decreased write traffic relative to write-through by more than 50%; periodic flushing of the dirty blocks increased write traffic only slightly compared to pure write-back, and then only for large cache sizes. Write-allocate had little effect compared to no-write-allocate. Block sizes of over a track don't appear to be useful. Limiting cache occupancy...

**Descriptors:** \*Distributed database systems; Buffer storage; Storage allocation (computer); Sequential switching; Algorithms; Statistical methods

**Identifiers:** Mainframe timesharing; Miss ratios; Run length; Traffic ratios; Cache residency times; Memory pollution; Prefetching algorithm; Write algorithm; Disk caching



29/3,K/51 (Item 1 from file: 34) [Links](#)

Fulltext available through: [USPTO Full Text Retrieval Options](#)

SciSearch(R) Cited Ref Sci

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07055482 **Genuine Article#:** 119FQ **No. References:** 48

**Integrating reliable memory in databases**

**Author:** Ng WT (REPRINT) ; Chen PM

**Corporate Source:** UNIV MICHIGAN,DEPT ELECT ENGN & COMP SCI, COMP SCI & ENGN DIV, 1301 BEAL AVE/ANN ARBOR/MI/48109 (REPRINT)

**Journal:** VLDB JOURNAL , 1998 , V 7 , N3 ( AUG ) , P 194-204

**ISSN:** 1066-8888 **Publication date:** 19980800

**Publisher:** SPRINGER VERLAG , 175 FIFTH AVE, NEW YORK, NY 10010

**Language:** English **Document Type:** ARTICLE ( ABSTRACT AVAILABLE )

**Integrating reliable memory in databases**

, 1998

**Abstract:** ...it is possible to create an area of main memory that is as safe as disk from operating system crashes. This paper explores how to integrate the reliable memory provided by the Rio file cache into a database system, Prior studies have analyzed the performance benefits of reliable memory, we focus instead on how different designs affect reliability. We propose three designs for integrating reliable memory into databases: non-persistent database buffer cache,persistent database buffer cache, and persistent database buffer cache with protection. Non- persistent buffer caches use an I/O interface to reliable memory and require the fewest modifications to existing databases. However, they waste memory capacity and bandwidth due to double buffering. Persistent buffer caches use a memory interface to reliable memory by mapping it into the database address space. This places reliable memory under complete database control and eliminates double buffering, but it may expose the buffer cache to database errors. Our third design reduces this exposure by write protecting the buffer pages. Extensive fault tests show that mapping reliable memory into the database address space does not significantly hurt reliability. This is because wild stores rarely touch dirty, committed pages written by previous transactions. As a result, we believe that databases should use a memory interface to reliable memory.

**Identifiers--** ...HIGH-PERFORMANCE; FAULT INJECTION; SYSTEM; RECOVERY; STORAGE; FINE

29/3,K/67 (Item 2 from file: 94) [Links](#)

Fulltext available through: [USPTO Full Text Retrieval Options](#)

JICST-EPlus

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02198385 JICST Accession Number: 94A0732377 File Segment: JICST-E

**A Data Management Method for Flash Memory and Its Performance Evaluation.**

TAKAKURA HIROKI (1); KANBAYASHI YAHIKO (1)

(1) Kyoto Univ., Fac. of Eng.

Joho Shori Gakkai Kenkyu Hokoku , 1994 , VOL.94,NO.62(DBS-99) , PAGE.233-240 , FIG.17, REF.6

Journal Number: Z0031BAO ISSN: 0919-6072

Universal Decimal Classification: 681.3:061.68 681.32+

Language: Japanese Country of Publication: Japan

Document Type: Journal

Article Type: Original paper

Media Type: Printed Publication

**A Data Management Method for Flash Memory and Its Performance Evaluation. , 1994**

**Abstract:** In order to realize highly reliable main memory databases, main memory data should periodically be checkpointed to archive storages. Since flash memory can realize faster access speed than disks, utilization of flash memory as archive storages can realize effective checkpoint operations. Furthermore, a requirement to used flash memory as archive and secondary storages is arisen. In this paper a data management method to realize such storages is discussed. A method which utilizes special data structure, F-tree, and overwrite technique without erase operations is also discussed. Simulation results show that our method can practically utilize flash memory for secondary storages. (author abst.)

**Descriptors:** ...storage management

**Broader Descriptors:** ...resistance(endure);

## EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	20	"20050119987" "20040064474" "20020073082" "20030163663" "20050216653" "20020032691" ("5345581" "4905184" "4864532" "6067551").pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/28 11:35
L2	0	L1 and (((transfer\$4 transmit\$6) near5 block\$1) and ((last near3 pointer) SAME (pend\$3 NEAR3 transfer\$4) SAME synchronizat\$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/28 11:36
L3	0	L1 and (determin\$5 WITH (committ\$5) With (transferr\$3 transmitt\$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/28 11:37
L4	0	L1 and (determin\$5 WITH (committ\$5) With (transferr\$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/28 11:38
L5	0	L1 and (transfer\$5 and (point\$3) and (block\$1 WITH record\$1))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/28 11:39
L6	0	L1 and ((transfer\$5 transmit\$6 send\$) and (point\$3) and (block\$1 WITH record\$1))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/28 11:39
L7	1	L1 and ((memory disk) near3 database)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/28 11:41
L8	1	L1 and (((memory disk) near3 database) and (pointer))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/28 11:41

## EAST Search History

S1	1	"611552".apn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 09:41
S2	16	"20020174138" "20020029214" ("6457021" "6341288" "6321234" "6205449" "6298425" "6032158"). pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 13:44
S5	3574	RDBMS OR (relational adj data\$base adj managment adj system)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 09:37
S7	257	S5 and (((synchronize\$1 OR synchronization) OR link\$3) near3 record\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 09:44
S13	8	("20020174138" "20020029214" ("6457021" "6341288" "6321234" "6205449" "6298425" "6032158"). pn.) and (synchronize\$1 or synchronization or link\$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 09:47
S14	0	S13 and (meta\$data or metadata)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 09:47
S15	7	S13 and structure\$1	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 09:47
S16	5	S15 and header	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 10:50

## EAST Search History

S17	189	Tamino	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 10:50
S21	173	\$software\$ag\$.AS.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 10:52
S23	73	\$software\$ag\$.AS.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 10:53
S24	23	software\$ag\$.AS.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 10:53
S26	5	software\$ag\$.AS. and (synchroniz\$3 or link\$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 10:54
S27	3	software\$ag\$.AS. and (synchroniz\$3 or link\$3) and (header OR meta\$data OR metadata)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 10:56
S28	2	software\$ag\$.AS. and (synchroniz\$3 or link\$3) and (header OR meta\$data OR metadata) and pointer	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 10:55
S29	88	S7 and (meta\$data or metadata or header)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 11:02

## EAST Search History

S30	41	S29 and pointer	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 11:02
S31	36	S30 and (data near1 structure)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 11:03
S32	36	S31 and ((link\$3 OR synchroniz\$4) near3 (record or data))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 11:04
S33	28	S31 and (transfer\$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 11:40
S34	0	S33 and (software\$ag.AS.)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 11:08
S35	4554	707/1.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 11:40
S36	53	S35 and (synchroniz\$4 OR link\$3) and (meta\$data or metadata OR header) and (pointer) and ((relational adj data\$base adj management adj system) or RDMS)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:04
S37	0	S36 and (name.AND (last adj1 pointer) and (flush adj1 pointer) and ((head or lead) adj pointer))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 11:42

## EAST Search History

S38	42	S36 and (data adj1 structure)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:32
S39	4009	"42" and ((creat\$3 OR making OR opening) near2 header)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 11:44
S40	1	S38 and ((creat\$3 OR making OR opening) near2 header)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 11:44
S41	0	"5329619".pn. and (synchroniz\$4 OR link\$3) and (meta\$data or metadata OR header) and (pointer) and ((relational adj data\$base adj management adj system) or RDMS)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:31
S42	1	"5329619".pn. and ((synchroniz\$4 OR link\$3) and (meta\$data or metadata OR header) and (pointer))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:14
S43	0	"5329619".pn. and ((synchroniz\$4 OR link\$3) and (meta\$data or metadata OR header) and (pointer)) and (new near2 (data or record))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:14
S44	1	"5329619".pn. and ((synchroniz\$4 OR link\$3) and (meta\$data or metadata OR header) and (pointer)) and (data or record)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:20
S45	298373	(data or document) near3 (retrieval OR retriev\$3 OR access\$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:20

## EAST Search History

S46	39297	S45 and (writing) near3 (data OR record)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:21
S47	33	S46 and header	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:21
S48	33	S47 and pointer	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:21
S49	32	S48 and (transfer\$4 or moving or copy\$3) near3 (data OR record\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:23
S50	0	S49 and ((synchroniz\$4 OR link\$3) WITH new WITH header)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:23
S51	0	S48 and (data NEAR2 strucutre)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:24
S52	0	S49 and (data NEAR2 strucutre)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:24
S53	32	S49 and (data NEAR2 structure)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:24



## EAST Search History

S54	1	S53 and 707/1.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:24
S55	9	S53 and "707"/\$.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:39
S56	299	RDBMS and daemon	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:39
S57	39	S56 and (new near3 record)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:40
S58	0	S57 and ((writting OR write\$1) WITH (new adj2 record))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:41
S59	23	S57 and (writting OR write\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 12:42
S60	4	S59 and header	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 13:16
S61	5412	(updat\$3 or writ\$3 or synchroniz\$3 or synchronization) near (real\$time or realtime or partial or "as available" or undemand\$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:34

## EAST Search History

S62	168	S61 and "linked list"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 13:18
S63	75	S62 and header	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 13:18
S64	69	S63 and pointer	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 13:18
S65	66	S64 and (transferring OR transfer\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:34
S66	0	S65 and (last near commit near pointer)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:33
S67	0	S65 and (commit near pointer)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 13:20
S68	0	S65 and (committing near pointer)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 13:20
S69	10	S65 and (head near pointer)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/13 13:20

## EAST Search History

S76	8132	(updat\$3 or writ\$3 or synchroniz\$3 or synchronization) near2 (real\$time or realtime or partial or "as. available" or undemand\$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 10:58
S77	11396	"linked list"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 10:58
S78	276	S76 and S77	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 10:58
S80	115	S78 and header	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 10:58
S81	107	S80 and pointer	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 10:58
S82	10	S81 and ((link\$3 OR synchroniz\$3) near2 record\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 10:59
S83	8	S81 and ((creat\$3 OR mak\$3) near2 header)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 10:59
S84	5	S82 and S83	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 11:06
S86	1	("2003/0229884").URPN.	USPAT	OR	ON	2005/12/14 13:35

## EAST Search History

S90	1	("20030229884" or "6954757.pn.") and (updat\$3 or writ\$3 or synchroniz\$3 or synchronization) near2 (real\$time or realtime or partial or "as available" or undemand\$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 13:33
S91	2	"6954757".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 13:33
S92	1	("2003/0229884").URPN.	USPAT	OR	ON	2005/12/14 13:36
S93	2	("20020174138" "20020029214" "6457021" "6341288" "6321234" "6205449" "6298425" "6032158").pn.) and "linked list" and header	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 13:45
S94	2	("6457021" "6341288").pn. and header and "linked list" and pointer	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 13:46
S95	2	S94 and ((updat\$3 or writing or write\$1 or synchronization or synchroniz\$3) near3 (record\$1 or data or realtime or partial or available or undemand))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 17:07
S96	2	"6151602".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 17:04
S97	2	"6151602".pn. and ((updat\$3 or writing or write\$1 or synchronization or synchroniz\$3) near3 (record\$1 or data or realtime or partial or available or undemand))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 17:05
S99	1	"6151602".pn. and ((updat\$3 or writing or write\$1 or synchronization or synchroniz\$3) near3 (record\$1 or data or realtime or partial or available or undemand)) and header	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 17:05

## EAST Search History

S10 0	1	"6151602".pn. and ((updat\$3 or writing or write\$1 or synchronization or synchroniz\$3) near3 (record\$1 or data or realtime or partial or available or undemand)) and header and pointer	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 17:05
S10 1	2	("6341288" or "6151602").pn. and header and pointer	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 17:08
S10 5	2	("6341288" or "6151602").pn. and ((generat\$3 or build\$3 or creat\$3 or making or make\$1 or new) near3 header) and pointer	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 17:19
S10 8	1	("6341288" or "6151602").pn. and ((generat\$3 or build\$3 or creat\$3 or making or make\$1 or new) near3 header) and pointer and "linked list"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 17:20
S10 9	1	("6341288" or "6151602").pn. and ((generat\$3 or build\$3 or creat\$3 or making or make\$1 or new) near3 header) and pointer and ((updat\$3 or writ\$3 or synchroniz\$3 or link\$3) near (real\$time or partial or "as available" or undemand or new))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 17:24
S11 0	1	((("6341288" or "6151602").pn. and ((generat\$3 or build\$3 or creat\$3 or making or make\$1 or new) near3 header) and pointer and ((updat\$3 or writ\$3 or synchroniz\$3 or link\$3) near (real\$time or partial or "as available" or undemand or new))))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 19:20
S11 2	1	"6457021".pn. and (link\$3 or synchronization or synchroniz\$3 or combining or combine\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 18:16
S11 4	1	"6341288".pn. and (link\$3 or synchronization or synchroniz\$3 or combining or combine\$1) and header and pointer	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 18:48

## EAST Search History

S11 6	1	"611552".apn. and "linked list"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 18:48
S11 8	2	("6457021" "6341288").pn. and header and "linked list" and pointer	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/14 19:22
S11 9	2	"6754648".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 07:15
S12 1	0	"6754648".pn. and ((updat\$3 or writ\$3 or synchroniz\$3 or synchronization) near2 (real\$time or realtime or partial or "as available" or undemand\$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 07:46
S12 2	1	"6856993".pn. and ((updat\$3 or writ\$3 or synchroniz\$3 or synchronization) near2 (real\$time or realtime or partial or "as available" or undemand\$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 07:46
S12 3	1	"6856993".pn. and ((updat\$3 or writ\$3 or synchroniz\$3 or synchronization) near2 (real\$time or realtime or partial or "as available" or undemand\$3) and header)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 07:47
S12 4	1	"6856993".pn. and ((updat\$3 or writ\$3 or synchroniz\$3 or synchronization) near2 (real\$time or realtime or partial or "as available" or undemand\$3) and header and pointer)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 08:12
S12 5	2	("6341288" "6457021").pn. and (transfer\$4 OR mov\$3 OR relocat\$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 09:08

## EAST Search History

S12 6	47	list SAME (commit OR committing OR committed) same header	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 09:58
S12 7	16	S126 and "linked list"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 09:10
S12 8	29	S126 and pointer	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 09:10
S12 9	16	S127 and S128	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 11:56
S13 0	0	"5701480".pn. and (list SAME (commit OR committing OR committed) same header)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 12:05
S13 1	3	S129 and tail	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 11:05
S13 2	3	S131 and header	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 11:05
S13 3	0	("5870751" "6785696").pn. and ((creat\$3 or mak\$3 or new or generat\$3) WITH header)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 11:56

## EAST Search History

S13 4	2	("5870751" "6785696").pn. and header	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 11:43
S13 5	11	S129 and ((creat\$3 or mak\$3 or new or generat\$3) WITH header)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 12:09
S13 9	23361	((creat\$3 or mak\$3 or new or generat\$3) near5 header)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 10:40
S14 0	13467	((creat\$3 or mak\$3 or new or generat\$3) near2 header)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 12:10
S14 1	7724	((creat\$3 or mak\$3 or new or generat\$3) near1 header)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 12:10
S14 2	451	S141 and "linked list"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 12:58
S14 4	0	S142 and (commit Near5 history)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 12:11
S14 5	2	S142 and (commit WITH pointer\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 12:11



## EAST Search History

S14 8	402	S142 and pointer\$1	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 12:59
S15 0	205	S148 and (new near (record or data))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 12:59
S15 1	154	S150 and ((transfer\$1) near1 (record or data))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 13:07
S15 2	10	S150 and ((transfer\$1) near1 (record or data) near4 list)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 13:01
S15 3	8	S151 and "707"/\$.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 13:21
S15 4	4	S153 and commit\$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 13:21
S15 5	13	("4586027"   "4775969"   "4849878"   "4853921"   "4868570"   "4891784"   "5194995"   "5200864"   "5280600"   "5298895"   "5313604"   "5335328"   "5481701").PN.	US-PGPUB; USPAT; USOCR	OR	ON	2005/12/15 14:35
S15 6	1	"5870751".pn. and pointer\$1 and "linked list" and header and commit\$4 and (creat\$3 or generat\$3) and link\$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/15 16:11

## EAST Search History

S16 3	4	("5592664" "5586280" "6785696" "6128771" "5329619").pn. and (disk\$memory OR disk OR virtual)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 11:00
S16 7	5	("5592664" "5586280" "6785696" "6128771" "5329619").pn. and (flag\$1 or bit or pointer)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 10:46
S16 9	9881	((accomplish\$3 commit or committed or committing) near3 (flag\$1 or bit or pointer))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 10:46
S17 0	491	((commit or committed or committing) near3 (flag\$1 or bit or pointer))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 10:46
S17 1	137	((commit or committed or committing) near3 (pointer))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 10:46
S17 2	59	((commit or committed or committing) near (pointer))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 10:50
S17 3	48	((flush\$3) near (pointer))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 10:47
S17 4	3	((last or end\$3) near flush\$3 near (pointer))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 10:47

## EAST Search History

S17 5	1	((last or end\$3) near (commit or committed or committing) near (pointer))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 10:48
S17 6	6	((last or end\$3) near2 (commit or committed or committing) near2 (pointer))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 10:48
S17 7	18	((commit or committed or committing) near (pointer)) WITH (data or record)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:09
S17 8	4	("5592664" "5586280" "6785696" "6128771" "5329619").pn. and (disk\$memory OR disk OR virtual) and transfer\$4	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 11:01
S17 9	0	"6128771".pn. and "not committed"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 11:54
S18 0	1	"6128771".pn. and (committed OR commit\$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 12:06
S18 1	1	"6128771".pn. and "commit transaction"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 12:06
S18 2	4	((commit or committed or committing) near (pointer)) WITH (data or record)) and ((flush\$3 OR (ready near3 commit\$4)) near pointer)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 12:20

## EAST Search History

S18 3	3	((commit or committed or committing) near (pointer)) WITH (data or record)) and ((flush\$3 OR (ready near3 commit\$4)) near pointer) and "read pointer"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/12/18 12:22
S18 4	3	((commit or committed or committing) near (pointer)) WITH (data or record)) and ((flush\$3 OR (ready near3 commit\$4)) near pointer) and "read pointer" and "write pointer"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:09
S18 5	19	((commit or committed or committing) near (pointer)) WITH (data or record)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:43
S18 6	3	((commit or committed or committing) near (pointer)) WITH (data or record)) and ((flush\$3 OR (ready near3 commit\$4)) near pointer) and "read pointer" and "write pointer"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:09
S18 7	8845	707/101,100,102.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:29
S18 8	1	S187 and S185	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:29
S18 9	131	S187 and (synchroniz\$4 OR link\$3) and (meta\$data or metadata OR header) and (pointer) and ((relational adj data\$base adj management adj system) or RDMS)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:31
S19 0	88	S189 and (data adj1 structure)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:32

## EAST Search History

S19 1	1	S190 and (last near commit near pointer)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:33
S19 2	59	S190 and (transferring OR transfer\$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:34
S19 3	2	S192 and ((updat\$3 or writ\$3 or synchroniz\$3 or synchronization) near (real\$time or realtime or partial or "as available" or undemand\$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/24 15:34
S19 4	0	(S185 or S187) and (((transfer\$4 transmit\$6) near5 block\$1) and ((last near3 pointer) SAME (pend\$3 NEAR3 transfer\$4) SAME synchronizat\$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/28 11:36
S19 5	5	(S185 or S187) and (determin\$5 WITH (committ\$5) With (transferr\$3 transmitt\$4))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/28 11:37
S19 6	4	(S185 or S187) and (determin\$5 WITH (committ\$5) With (transferr\$3))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/04/28 11:38